

**SMALL SCALE FARMERS' AWARENESS OF ORGANIC
AGRICULTURE IN SELECTED FARM BLOCKS OF CHONGWE
DISTRICT**

BY

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Dissertation submitted to the University of Zambia in partial fulfillment of the Requirements for the Award of Master of Education degree in Environmental Education.

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DECLARATION

I, Sitali, Namakando, Grace hereby declare that the dissertation hereby submitted is my own work and it has not previously been submitted for a degree, diploma or other qualification at the University of Zambia or any other university.

Signed

Date

CERTIFICATE OF APPROVAL

The University of Zambia approves this dissertation of SITALI NAMAKANDO GRACE as fulfilling part of the requirements for the award of the degree of Master in Environmental Education.

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ABSTRACT

This study explored small scale farmers' awareness of the use of organic agriculture for a sustainable environment in selected farm blocks of Chongwe District. The study was realized through the following objectives; determining the nature of farming systems in Chongwe District, ascertaining awareness of programmes in organic agriculture amongst small scale farmers and establishing participation in training activities aimed at promoting organic agriculture. The significance of the study was to advocate for sustainable forms of agriculture such as organic agriculture in achieving a sustainable environment.

The study predominantly employed a qualitative research design. This was done by means of a case study approach. The methods used for data collection were semi structured interviews and questionnaires. The sample size was 65 respondents which comprised 61 small scale farmers who were sampled using snowballing procedure, 1 official of a sustainable agricultural centre and 3 extension officers were sampled purposively.

The results established that despite the high levels of knowledge about organic agriculture in the area, adoption of the farming system was still low amongst small scale farmers in Chongwe District. The study further revealed that majority of the respondents were aware of the awareness programmes aimed at promoting organic agriculture in the area, though very few of the respondents had accessed training due to long distances between farm villages and the training centre. Thus training providers for organic agriculture needs to host training programmes within the villages to enable an inclusive participation amongst the farmers. This kind of farming system would help in maintaining sustainability of the environment.

Additionally, the study revealed that training in organic agriculture was mainly advocated by a non-governmental organisation in the area. Therefore, the study recommended that government prioritise organic agriculture through its agricultural policies and offer financial support to institutions offering training in organic farming to enable more small scale farmers engage in organic agriculture.

In stressing the need for sustainability of the environment, the study suggested the following future area of research; an assessment of the effects of conventional agriculture on small scale farmers in rural communities.

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CHAPTER ONE: BACKGROUND OF THE STUDY

1.0 Overview

This chapter is an introduction to the study. It outlines the background of the study, the statement of the problem, purpose, objectives and research questions of the study. Further on, limitations, delimitation and operational definition of terms are presented in this chapter.

1.1 Introduction

Some practices of agriculture are at the centre of environmental problems faced in most countries. According to Ramakrishnan and Panneerselvam, (2005), our planet earth today faces a major challenge of environmental degradation because of poor agricultural practices. One of the reasons for this is lack of environmental awareness by farmers in their choice of farming systems.

To reduce the negative effects of environmental degradation resulting from unsound agricultural systems, there is an urgent need for environmental literacy for all the communities engaging in agriculture. If farmers are aware of environmental problems that could result from unsustainable forms of agriculture, they would engage in farming practices that protect the environment from further degradation. By so doing the environment would be sustained and allowed to regenerate to its initial productivity and survive for future generations.

In Zambia, like other countries the economy has been highly dependent on agriculture. This is with the implication that most communities comprise farmers. In line with this FAO, (2008) states that small scale farms constitute 90% of the world's farms that provide employment to 1.3billion people and dominate agriculture in developing countries.

Thus, most local communities engage in agriculture to supplement their low incomes. Land fertility is mostly achieved by adding chemical fertilisers which reduce the lifespan of the soil. The Food and Agriculture Organisation (2005) observed that, modern agricultural methods had brought spectacular increases

in productivity over the past forty years. There has also been remarkable growth in agricultural production with per capita world food production growing by 17 per cent and aggregate world food production growing by 145 per cent.

Though the current global food production practices may produce striking quantities, their environmental degradation surpasses the benefits. Modern technologies in agriculture, therefore, have brought about more adverse effects on the environment than benefits.

The increase of input prices has also had a negative impact on the farmers. For example, between 2006 and 2008, the rate of increase in the price of fertiliser was higher than the increase of food prices (Dorwad and Poulton,2008).This is also evident in Zambia where recently the government removed agricultural subsidies impacting negatively on the input prices and food security for the poor small scale farmers. Consequently, small scale farmers are in need of low-cost technology to reduce over dependency on expensive chemical fertilisers which also result into environmental degradation.

One of the solutions to these problems is organic agriculture. The International Federation of Organic Agriculture Movements (IFOAM) (2005) defines organic farming as a form of agriculture that unites all agricultural systems that maintain ecologically, socially and economically advisable agricultural production. These systems make use of the natural potential of plants, animals and landscapes and are aimed at the agricultural practice's harmonization with the environment.

Organic farming significantly reduces the input of external resources by putting a limit to usage of the chemically obtained fertilisers, pesticides and pharmaceutical preparations. In addition to increasing the yield and protect crops, organic farming employs other agro technical methods and various natural factors.

Organic agriculture is less costly and utilises locally available resources thereby reducing over dependency on expensive inputs resulting into the small scale farmers' affordability of required inputs and conservation of the environment.

As opposed to the conventional agriculture practices, organic agriculture aims to maintain the societal and individual responsibility for the environment to achieve sustainability of natural resources. This is the more reason why small scale farmers need to be sensitised on the dangers of conventional agriculture and the availability of a convenient farming practice.

Institutions such as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), (2002) foster the awareness of organic agriculture as one of the comprehensive response to the sustainability problems facing agriculture for rural communities and food production today. Organic Agriculture reduces production cost as it provides an efficient use of farm resources and has the potential to improve the small scale farmers' livelihoods as opposed to the chemical pesticides that affects negatively on humans as well as on the environment.

It is therefore, important that local farmers are encouraged to practice organic agriculture as it would not only contribute to food security for the local farmers but would also reduce the heavy dependency on expensive inputs. Undoubtedly, organic agriculture is one of the best practices in ensuring environmental sustainability. Hence this study makes an attempt to investigate the state of awareness of small scale farmers on the use of organic agriculture for a sustainable environment amongst small scale farmers in Chongwe District of Zambia.

1.2 Statement of the Problem

Unsustainable form of agriculture is one of the major causes of environmental degradation in Zambia. This type of agriculture mostly uses chemical fertilisers for increased yields and pesticide control which result into pollution of water

and soil erosion. Deforestation is another problem caused by some traditional forms of agriculture. The environmental problems being faced in many countries including Zambia result into climate change which also has adverse effects on small scale farmers. Environmental problems caused by unsustainable forms of agriculture have also been aggravated by lack of knowledge on the use of natural resources such as those used in organic agriculture (ECZ, 2008). There is, therefore, urgent need for the promotion of environmental awareness in changing attitudes towards organic agriculture for the benefit of the environment and the small scale farmers.

Kasisi Agriculture Training Centre conducts various training programmes on organic agriculture to small scale farmers of Chongwe district. Regrettably, despite the organisation being involved in awareness programmes aimed at mitigating environmental problems resulting from unsustainable forms of agriculture through the promotion of organic agriculture, the state of awareness on the use of organic agriculture amongst small scale farmers in the community is not known. In order to address such a problem, this study seeks to investigate the state of awareness of the small scale farmers of Chongwe District about organic agriculture.

1.3 Purpose of the Study

The purpose of the study was to assess the state of environmental awareness on the use of organic agriculture amongst small scale farmers in selected farm blocks of Chongwe District of Lusaka Province.

1.4 Objectives of the Study

The above aim was realized through the following specific objectives:

1. To determine the nature of farming activities undertaken by small scale farmers in Chongwe District.
2. To ascertain awareness of organic agriculture programmes by small scale farmers in Chongwe.

3. To establish the participation of small scale farmers in training aimed at promoting organic agriculture in Chongwe.

1.5 Research Questions

The set out objectives were realised through the following research questions:

1. What is the nature of farming systems undertaken by small scale farmers in the study area?
2. Are small scale farmers aware of organic agriculture programmes in the area?
3. How is the participation of small scale farmers in training aimed at promoting Organic Agriculture?

1.6 Significance of the study

The study is important because the findings may reveal the state of awareness about organic agriculture of the small scale farmers in Chongwe District. It was also imperative to undertake this study because its findings might also help the Ministry of Agriculture and Livestock to make informed decisions and identify gaps that could be addressed in the implementation of organic agriculture for a sustainable environment.

The study may also demonstrate the nature of farming systems undertaken by small scale farmers in Chongwe. The results could be useful to the government and other relevant organisations responsible for the provision of environmental awareness in alleviating the negative impacts of unsustainable farming methods to small scale farmers through the implementation of applicable programmes for changing attitudes towards organic agriculture in the study area.

The government and the relevant organisations involved in promoting sustainability of the environment through sustainable forms of agriculture may also utilise the results of the study to ascertain participation of small scale farmers in training aimed at promoting organic agriculture in Chongwe

District. Moreover the study may bring out recommendations that would address environmental degradation of the environment resulting from the use of synthetic fertilisers through promotion of organic agriculture in achieving a sustainable environment for small scale farmers in Chongwe.

1.7 Delimitation of the Study

This study was only conducted in the selected farm blocks of Chongwe District of Lusaka Province. The rationale for confining the study to Chongwe District was based on the fact that there was an agricultural training centre in the catchment area.

1.8 Limitations of the Study

Since only snowballing and purposive sampling procedures were used in this study, it was difficult to generalize the results to the population of small scale farmers and training providers in Chongwe District and other areas . However, the results are generalisable to small scale farmers and training providers sampled and give an insight of what the picture could be like if more participants and other methods were used.

1.9 Definition of Terms

The following definitions mean the way the researcher has defined them and not the way they have been defined by other researchers.

Environmental degradation is the deterioration of the environment through depletion of natural resources.

Organic agriculture is a form of agriculture that unites all agricultural systems that maintain ecologically, socially and economically advisable agricultural production. These systems make use of the natural potential of plants, animals and landscapes and are aimed at the agricultural practice's harmonization with the environment. Organic farming significantly reduces the

input of external resources by putting a limit to usage of the chemically obtained fertilisers, pesticides and pharmaceutical preparations.

Conventional agriculture is farming that entails the excessive tillage of land and extensive use of synthetic fertilisers and pesticides to boost yields.

Conservation agriculture is the farming type that encompasses minimal tillage of land and minimal use of chemical fertilisers, pesticides and crop rotation.

Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Small scale farming is an agriculture practice where farmers produce crops mainly for consumption.

CHAPTER TWO: LITERATURE REVIEW

2.0 Overview

This chapter will review relevant literature using the thematic approach. Thus the chapter will review relevant literature on what is already known about the causes of environmental degradation due to unsustainable forms of agriculture and the importance of farmers' awareness of organic agriculture for the benefit of the environment.

The review will further extend to studies done in organic agriculture and how Zambia and other countries have been affected by unsustainable agriculture.

2.1 Background

Much of the studies conducted in the field of agriculture have revealed that the issue of land degradation has been a huge challenge. It has been documented that several factors have contributed to land degradation due to certain agricultural systems.

A report by E.C.Z (2000) revealed that land degradation in Zambia mainly arises from the use of heavy machinery especially by the mines which tends to cause soil compaction while application of huge amounts of chemical fertilisers on a regular basis tends to degrade the land. The report was a clear indication that unsustainable farming systems have also contributed greatly to land degradation in Zambia. Thus small scale farmers who are the majority need awareness on sustainable forms of agriculture to sustain the environment.

In agreement, Zhao (1990) states that degradation of the soil; particularly of agricultural land through erosion is the fundamental constraint to sustainable development. The research conducted by FAO (1990), adds that agricultural expansion is the major cause of deforestation particularly in the tropics. And as such a study by Oldeerman (1991) indicates that 25% of present arable land is affected by human induced soil degradation.

Stocking (1994) also agrees that cultivation of soils and soil degradation through various farming practices has resulted into the loss of billions of tones of organic carbon and nitrogen in most parts of the world during the last three centuries.

Brennan(1990) states that solutions to soil degradation resulting from unsustainable forms of agriculture such as improving the information base, changing institutional mechanisms in land use by governments and promoting land conservation by ensuring that farmers have access to the technological inputs are required in developing technologies that are appropriate to farmer needs.

For this reason, interventions in alleviating soil degradation resulting from unsound agricultural practices through environmental awareness are vital in sustainably raising crop yield for small scale farmers.

The study by the International Assessment of Agriculture Science and Technology for Development (IAASTD, 2008) responds to the widespread realization that despite significant scientific and technological achievements in the ability to increase agricultural productivity in Africa, there has been less attention paid to some of the unintended social and environmental consequences of the achievements. The study further states that in order to address the diverse needs that shape human life there is need to have a shared approach to sustainability with local and cross sectional collaboration through creating awareness about the environment (IFOAM, 2012).The above interventions demonstrate the possible solution to the sustainability problems being faced in the world today due to unsustainable agriculture.

However, O' Donogue (2007) argues that environmentalists and educators should become concerned about the need to do more than raise awareness about sustainability issues or provide learners with experiences. However ,more is needed to be done in developing a broad range of methodological processes.

It further states that divergent methods are relevant for environmental learning towards better sustainability of the environment. Therefore, literature reviewed indicated that there was a gap in how relevant institutions particularly in the field of agriculture were dealing with fostering of sustainable forms of agriculture. Hence this is the gap this study tried to fill.

2.2 Comparisons between conventional and sustainable farming systems

Knowledge and technology have been major drivers of change in farming systems. The availability of new industrial technologies and the corresponding reaction to it by the organic farming community has fundamentally changed agriculture over the past 50 years especially; with the development of new synthetic fertilisers and control agriculture through genetic engineering technology with the promise of increasing disease resistance and facilitating weed control (FAO,2005).To this end modernity has impacted negatively on agriculture through some of its adverse effects. Matson (1997) agrees with this that in developed countries, industrial agriculture which predominantly implies conventional agriculture tends to focus on short term productivity rather than on long sustainability. This farming system leads to reduction of innate soil fertility, in the process diminishing its nutrients and destroying the complex web of life in the soil. Thus the soil becomes deprived of the needed nutrients, leading to degraded soils which do not retain enough water and ultimately causes pollution of water and soil. A scenario is also yet to be assessed in this study whether relevant institutions are mitigating the impacts of technology and modernity resulting from unsustainable agriculture through creation of awareness on environmental sustainability.

Conventional farming systems have also encouraged the expansion of huge farms, the development of larger more powerful machinery and the ever increasing use of new herbicides and pesticides. Small scale farmers are often resource poor and unable to buy expensive inputs without risk of indebtedness (Halberg and Mueller,2013).

In addition, conventional forms of agriculture promote a monoculture of an increasingly limited variety of annual plants and are inherently energy inefficient. As a result, energy inputs to maintain this artificial farming system actually exceeds energy outputs. This is because, conventional farming systems use non fossil fuels to not only harvest and plant but also to produce and apply nitrogen rich fertilisers which affect the environmental sustainability of the soil (Schoenherr, 1992).

Saasa (2003) in his study of agricultural intensification in Zambia indicates that in Zambia, agricultural subsidies have been considered by donors to be causing serious economic distortions and inefficiencies in the national food production system. This distortion has resulted in high prices for input prices depended on by most farmers, thereby impacting negatively on the food security and sustainability of the environment in the country.

Further study by Saasa revealed that small scale farmers heavily depended on subsidised farming inputs for their agricultural activities. Hence the study showed that more was needed to be done for the farmers to shift from heavy dependency on farming inputs in order to preserve the remaining natural resources. This is also the point of focus for this current study.

Dorwad and Poulton (2008) assert that the increase of input prices has further worsened the situation in most developing countries. The high input prices impacts negatively on the resource poor small scale farmers who are heavily dependent on chemical fertilisers and as a result causes environmental degradation through loss of needed soil nutrients. As to whether or not this is the case for small scale farmers in Chongwe, is one of the variables in this study.

2.3 Environmental impacts of conventional agriculture

Preety (2006) and ECZ (2000) have confirmed that pesticide use is the cause of many health problems and environmental degradation in many developing and developed countries due to lack of knowledge and protection while spraying.

A review of literature from the United States in the state of California on the effects of conventional agriculture in the United States revealed that grasslands and valleys have been devastated for almost 200 years mostly due to the introduction of monoculture agricultural production (Schoenherr, 1992).

This lack of diversity has resulted in the agriculture of California to be susceptible to a number of exotic pests increasing the devastation of arable farmland. Schoenherr further shows that huge water demands for conventional agriculture through modification of waterways have also limited water availability for biodiversity and habitat loss for most indigenous species. The study therefore, indicates that lack of diversity in agriculture results into negative devastation on the environment and as a result more was needed to be done to in diversifying the agriculture sector for the sustainability of the environment.

In agreeing to this , Smith et al (2011) states that sustainable forms of agriculture such as organic agriculture has the potential to reduce the risk of total production losses due to climate change impacts such as pest and disease outbreaks including the severity of plant and animal diseases which are a consequence of conventional agriculture. Smith et al further states that organic agriculture lessens the impact of climate change especially through crop diversity.

Turner (2004) also argues that effects of the current industrial predominant agricultural production system overuse resources such as water, energy and soil. The study by UNEP (2011)in agreement to Turner states that conventional agricultural systems use more energy than it produces in terms of calories.

Wichner (2015) at <http://www.farmlandlp.com> has argued that organic farming techniques also have harmful effects for plant species in certain areas such as California plant species due to the climatic conditions that prevail there.

The research by the Soil Association of England (2007) and other studies also contend with the fact that remarkable growth in the global markets for organic

food and drinks during the last decade 2002 to 2012, holds a risk of increasing the environmental load from long distance transportation of products and of pushing the organic food and farming systems towards the conventional farming model and thereby diminishing the environmental benefits of organic agriculture mostly through greenhouse gas emissions.

Halberg (2007) further shows that transportation of foods is a matter of concern regarding environmental impact and in particular greenhouse emissions, acidification and fossil energy use in Europe. Though arguably, the impact on the environment is minimal as compared to that of conventional agriculture. Thus these are good reasons for focusing on consumption of locally grown organic products.

The study by FAO (2005) also pointed out that organic agriculture was more energy efficient than conventional agriculture and more labour intensive than none organic farming systems, hence played a great role in agriculture in many ways such as food security, increased income generation for farmers, preserving biodiversity and efficient use of water resources. As a result, sustainable agriculture has more evident benefits for the environment than conventional agriculture. The asserted benefits of organic agriculture in Zambia for the environment and small scale farmers in particular for those in Chongwe area is yet to be established in this study.

2.4 Effects of unsustainable practices of agriculture in Zambia

As pointed out already, ECZ established that land degradation in Zambia mainly arises from compaction of the soil and the use of chemical fertilizers in farming systems. These types of farming systems have had a negative effect on the environment in many parts of the country resulting into climate change. Since most Zambians depend on agriculture for their livelihood it entails that the entire country is affected with low crop yield.

ZEMA (2012) in its study of agricultural inputs indicated that most of the pesticides and toxic substances used in Zambia are imported and distributed by

local companies for agricultural use. Other than the emphasis on high yields farmers are not sensitised on the possible dangers of using these synthetic fertilisers and chemicals on their land and livestock creating a gap in environmental awareness about the use of organic agriculture as an alternative form of agriculture as it aims to avoid the usage of synthetic fertilisers and harmful pesticides including growth regulators and livestock additives.

To further support the effects of pesticides on the environment in India, Ramakrishnan (2005) acknowledges that pesticides are also a cause of water pollution. These substances enter water courses from agricultural and horticultural land posing great danger on human health and the environment.

Despite the documented dangers of synthetic fertilisers and pesticides, Zambia is reported to be witnessing a steady increase in the import and use of different types of pesticides for agriculture (ECZ, 2000). It is not known if ZEMA disseminates information on the dangers of synthetic fertilisers and pesticides to small scale farmers in Zambia.

A report by MOFNP (2006) revealed that the 2004/2005 agricultural season recorded a decline in food crops largely due to the unfavourable weather conditions in Zambia. The report established that in attempting to increase productivity more chemical fertilisers were used in that season. In turn more chemicals were released in the atmosphere causing irreversible damage to the environment.

On the other hand, Almeida and Abreu (2009) argued that the unacceptable exposure to pesticides in conventional farming is related to lack of proper education in application and implementation of sustainable agriculture. It is in this regard that this study was undertaken to establish the environmental awareness of small scale farmers on the use of organic agriculture in Chongwe for the sustainability of the available natural resources.

However, most farmers in many developing countries incline themselves to conventional agriculture despite the negative impacts of synthetic fertilisers on

the environment. The immense economic contribution of the industry continues to be realized by many suppliers. This has been without regard to the available resources for the present and future generations.

ECZ (2000) acknowledged that Zambia is also witnessing a steady increase in the import and use of different types of pesticides for both agriculture and public health. For this reason, international organisations and some non-governmental organisations have taken it upon themselves to foster cheaper and more sustainable forms of agriculture to farmers. Likewise, the importation of these agricultural inputs has also meant that there is less incentive to utilise local and natural products for agricultural production in helping to sustain local biodiversity. Whether or not there exist such organisations fostering organic agriculture for farmers in Chongwe is yet to be seen in this study.

2.5 Importance of organic agriculture

The cradle of organic farming lies in Europe where different actors in agriculture experimented with and developed forms of alternative agriculture from the early 1920's. A worldwide organic market has existed ever since Lockereiz (2007).

Globally, there have been many environmental organisations such as the IFOAM and indeed many others who have responded to calls for making agriculture sustainable through fostering organic agriculture to reduce soil erosion and decreasing the use of harmful chemicals in increasing yields (IFOAM, 2005).

Halberg and Muller (2013) identified organic agricultural systems as an alternative to conventional food producing systems. These farming systems face current economical and environmental challenges and are strictly regulated through the organic standards such as prohibition of chemical synthesis inputs and consist in a whole in farm approach including natural resources management and aiming to achieve self-sufficiency on farms.

A case study in Wanzai, China Qiao (2009) indicated a clear difference in the use of agro-ecological methods such as composting, intercropping and insect traps between the organic and conventional farms and also in the diversification of crops grown and livestock reared. Parrot and Marsden (2002) in referring to countries of the Global South which are from Africa, Latin America and Asia, the Middle East, states that improved training and extension services were imperative in the effective adoption of organic agriculture. Comparatively, Qiao et al (2009) and Parrot and Marsden (2002) argued that small holder farmers should be empowered with the benefit of agro-ecology for sustainability of their production systems. Suffice to say that there is no doubt that organic agriculture could play an important role in environmental sustainability in Africa (OPPAZ, 2007).

Twarog (2006) points out further benefits of organic agriculture that sustainable agricultural production systems, including organic agriculture are based on building strong and fertile soils. These production systems are more resilient in the face of climatic stress as the fields stay green for longer periods in times of drought and hold on to more nutrient-rich topsoil when it rains.

From the above mentioned characteristics soil quality is an important aspect in organic agriculture as crop production is largely dependent on soil health. Therefore, organic farmers work very hard to preserve the soil's ecosystem in order to benefit from better ecological yields. In Sub Sahara for example, over 95 per cent of synthetic agro-chemicals are imported from abroad representing a huge portion of these countries' bills. Training in sustainable agricultural production techniques, on the other hand can lead to the same increases in yields and even higher incomes for the farmers (Halberg and Mueller 2013). Lynch (2011) also documented that environmental benefit of organic agriculture which include lower resource, improved nutrient recycling, reduced energy use, increased soil biological activity and preservation of biodiversity.

FAO (2013) acknowledges that despite continued success stories in many parts of the world, organic agriculture has still not entered formal curricular and

extension services. It is hoped that government institutions get encouraged to support organic agriculture as its knowledge is a crucial factor for empowering resource poor farmers. Thus more is needed to be done by relevant institutions in creating awareness of organic farming as it is cardinal for farmers in the sustainable agricultural production and food security.

A report by Brennan (1992) additionally documented educational efforts on interactions between farmers and the environment need to be expanded to an even greater extent at all levels for them to have a greater understanding of environmental issues.

In addition, Parrot (2006) affirms that documentation on the use of organic principals and agro-ecological methods is scarce in both developed and developing countries. Another study of organic agriculture in African countries by Twarog (2006) identified some of the other barriers to the successful adoption of sustainable agriculture such as powerful vested interests which hindered changing of mindsets. This was particularly true for most farmers and as such, successful transition of farmers required not only a change in farming practices but also a change in the approach to learn new soil management skills and maintain soil fertility (OPPAZ, 2007).

However, little is known regarding to what extent organic farmers in developed and developing countries actually use agro-ecological methods and that certain farms employ few such methods and thus do not actively seek to follow the principles (Darnhofer , 2010).

In consolidating the argument on the importance of farmers' awareness of organic agriculture techniques, Stockdale et al (2001) agrees that besides using farmyard manure, organic farming also integrates techniques such as composting, crop rotation, inter cropping, crop residue return, straw residue return and mulching in preserving soil fertility and water conservation in the sustainability of the environment. The above literature points out the importance of farmers' awareness of organic agriculture for the sustainability

of the environment. As to how organic farming is perceived by farmers in Chongwe District is what this study intended to find out.

Much literature on organic agriculture had been concerned with awareness of consumers. For instance, a study in Denmark by Torjusen (2004) revealed that consumers' knowledge of organic agriculture was limited. Consumer awareness is an important aspect in organic agriculture as consumers have an inherent desire to know what kind of products they are consuming.

Zanoli (2004) also agrees with these studies that focus mainly on consumer awareness and mentions a recent survey to confirm the findings of whether organic consumers knew what organic agriculture products are in Europe. The results of the study also revealed that majority of consumers had no idea of the benefits of organic products.

A research of the Hungarian organic sector by Orsolya (2010) is another study on organic agriculture which focused on the differences between organic farming and conventional farming and highlighted the benefits of organic agriculture to the environment.

In line with the importance of consumer awareness of organic products, Sahota (2011) agrees that populations in general are becoming more conscious of their health and environmental issues and thus are worried about the health consequences of conventional agriculture and ingesting pesticides and are thereby buying safe, healthy food produced in an environmentally and animal welfare friendly manner.

Much as the above literature pointed out benefits of organic agriculture to the environment, however, awareness creation should begin with farmers who are involved in production of crops who should be exposed to information that is needed to make conscious decisions on their choice of farming systems in the interest of consumers and the environment. Thus small scale farmers' awareness of sustainable forms of farming systems is also cardinal in the sustainability of the environment.

Hermansen (2010) consents to the above that it is at the farming stage that the differences between organic and conventional production were to be determined. Therefore, it is important to understand the different impacts of organic production and conventional foods at the farm gate. This implied that farmers who were producers needed to be aware of the sustainable farming techniques. In this regard, successful transition to sustainable forms of agriculture such as organic farming is not a choice but a necessity for the long term survival of the environment. Unfortunately, this requires an education for all involved; both the farmer and the consumer. Hence, a large part of successful transition to sustainable agriculture is coupled with promotion of awareness programmes for farmers.

As documented by Hermansen (2010) organic production has some benefits compared to conventional farming such as avoidance of pesticides, especially for resource poor farmers in developing countries. In contrast to conventional agriculture, organic agriculture emphasises crop rotation and utilization of natural resources in preserving the natural biodiversity and sustaining the environment.

Thus, increased awareness should be undertaken by stakeholders such as government through relevant institutions and cooperating partners and should endeavour to sustain the environment Twarog (2006). Consequently, how the issue for creation of awareness on the use of organic agricultural farming systems for small scale farmers is done in Chongwe area is one of the objectives of this study.

2.6 Sensitisation and training

A report by UNESCO (1987) noted that nothing significant will happen to reduce local and international threats to the environment unless widespread public awareness is stimulated concerning the essential links between environmental quality and the continued satisfaction of human needs. Human action depends upon motivation, which depends upon widespread

understanding. This is why it is so important that everyone becomes environmentally conscious through proper environmental awareness.

Similarly, Mweemba (2009) in his study of environmental self efficacy and attitudes of small scale farmers in Zambia agrees that perception of the severity of environmental degradation appears to play a significant role in farmers' awareness and shaping of their attitude in changing their attitudes regarding land management practices in Zambia. The Environmental Management Act (2011) states that the Zambia Management Agency has a mandate to maintain an environmental database and conduct environmental education and awareness programme. Therefore, the significance of awareness of environmental degradation arising from unsustainable agriculture among small scale farmers in Chongwe is sought to be determined in the current study.

2.7 Participation in training

Provision of awareness programmes is one of the effective measures of achieving sustainable agriculture. WCED (1987) noted that agricultural productivity should be based on better controlled application of agrochemicals as well as on more extensive use of organic manures and non chemical means of pest control. In the same vein, a case of Western Uganda by Edward et al (2010) revealed that field schools played an important role in transmitting knowledge about organic agriculture through facilitation of farmer to farmer exchanges about sustainable agricultural production techniques.

In India for example, an independent association called the BIORE runs a training centre offering education in organic farming, vocational training, advisory services and provides interest free credit to farmers to develop infrastructure such as biogas facilities and provisions for safe drinking water including farm inputs such as seeds, deoiled castor rock phosphate ,botanical and microbial pesticides (Eyhorn, 2007).

Panneerselvam et al (2011) also observed that in India smallholders improved food security by increasing the intercropping yield and reducing the cost of

production mostly because they had benefitted from the environmental training offered by the association.

Similarly in Uganda small holder farmers had an increase in crop yields after acquiring skills and participating through an organic support operation. They also reduced the cost of production (Bolwig and Odeke, 2007).

A study by Willer and Kilcher (2011) agrees with the above assertion that Uganda comprises the largest area under certified organic production in Africa. The major reasons for the yield increase and organic expansion was the environmental awareness the farmers received resulting into improvement in organic matter accumulation in soils, reduced pesticide use thereby benefitting both the farmers and the environment. Farmer groups in Uganda have contributed to successful transition to organic farming, as farmers work with fellow farmers and in some cases with external facilitators.

A study by NOGAMU a local organic association in Uganda cited in Halberg and Mueller (2013) on the sustainability of farmer groups for small scale farmers revealed that sustainability of the farmer groups were more likely assured when they work with their own facilitator chosen amongst from the group members rather than a facilitator who worked with an organisation even if they were locally based. The ultimate goal of the groups was training of farmers to successfully transition to organic farming.

Zambia too has been striving to foster organic agriculture to small scale farmers and empower them with the knowledge of environmental sustainability through advocacy by some Non-Governmental Organisations such as the Biodiversity Community Network of Zambia (BCN) (DANIDA, 2011).

A study by JCTR on knowledge and attitudes of conservation and organic farming among small scale farmers in Zambia(2010) revealed that there exists a discrepancy in terms of practice and the knowledge about organic farming in most parts of the country. This is the more reason that Rosenberg (2010) indicated that awareness campaigns do not always lead to the intended action

as often people are aware of an issue but other factors prevent them from successfully acting on it. This is even the more reason that a lot needs to be done in terms of follow up awareness campaigns in striving to change attitudes of farmers towards organic farming for the sustainability of the environment.

Similar to the above, the ZEMA regional office of Livingstone in Zambia partnered with The Department of the Ministry of Agriculture to train a local green initiative group, which in turn trains local residents in waste management of surplus vegetables from vegetable markets and green leaves. The training included demonstrations on how to make household compost for organic fertiliser which they were able to use in growing vegetables for income generation. Waste management and composting played an important role in allowing resource poor households and farmers to grow and sell organic products. Even though, participants of the training revealed that a lot of people in the area had not understood the difference between non organic and organically produced vegetables (Growing Green, 2013). Probably one of the reasons that could be advanced was that the other residents in the area had not been made aware of sustainable ways of utilizing waste for the benefit of the environment.

In light of the importance of farmers' conversion to organic agriculture, Ediriweera (2007) acknowledge that conversion to organic agriculture can improve farmers' access to food for a longer period and reduce risk of indebtedness in case of crop failure.

KATC (2011) also agrees that using composts and manures provides a long term supply of nutrients as opposed to the short term inorganic nutrients provided by artificial fertilisers as the soluble nutrients do not contribute to the health and long term productivity of the soil and maintains soil fertility for present and future cropping.

The above literature has revealed that in many parts of the world including Zambia, there exists successful transit to organic farming through training. We

are yet to find out if this is extended to small scale farmers in Chongwe area, hence this study.

2.8 Challenges of organic agriculture

In agreement with the above on the issue of some residents not being aware of the benefits of organic agriculture, UNESCO (2006) states that when education levels are low sustainability of the environment is often affected through implementation, decision making and quality of life. It has also been argued that accessibility of information about organic farming to farmers could be a challenge especially to resource poor communities. The above coupled with lack of funding to run training programmes results in a serious adoption barrier in organic agriculture.

A study of agricultural intensification in Zambia by Saasa (2003) revealed that poor funding to the non-governmental organisations providing training in sustainable agriculture compromised effectiveness in the provision of information to farmers. Thus, local farmers need environmental awareness in organic farming techniques that would enhance sustainable agriculture.

In view of the above, the significance of farmers accessing information about organic agriculture is affirmed by Mueller (2011) describing organic agriculture as an information intensive farming system and that effectiveness of the farming system depended on interventions regarding extension services and training of farmers. It further points out that organic agriculture require knowledgeable extension services and technical assistance to build capacity in order to foster more sustainable as well as agro-ecologically sound production systems.

Preety (2006) has shown that many non-governmental organisations in developing countries introduce agro-ecological methods to small holder farmers through farmer field schools. It is clear that non-governmental organisations, contribute greatly in enhancing farmers knowledge and principles of sustainable agriculture.

FAO (2005) in its report has shown that most small holder farmers especially in developing countries are not receiving adequate extension services and advisory services mainly due to lack of support from relevant institutions such as governments. Inadequate support to organisations that foster sustainable agriculture could impact negatively on the recipients of the needed information who are the farmers in achieving sustainability of the environment through environmentally friendly farming systems.

Organic agriculture requires training, capacity building and inputs such as seeds and composting materials which are limiting factors in attaining sustainability if not provided by concerned government ministries (Panneerselvam, 2011).

A study by Morgan and Murdoch (2000) revealed that organic farming is a political struggle especially in developing countries as it has not been prioritised by most governments in terms of policy support. Lack of political will, could prove retrogressive to the development of sustainable development.

In support of the above, Twarog (2004) points out that despite the overwhelming evidence on the wide range of benefits for organic farming, few governments have adequately supported the farming system. The study further suggested that the responsibility of governments should be to act in the interest of the farmers and the environment by setting framework and incentive structures in implementing supportive policies and regulate markets. They can also provide information and bring stakeholders together.

Chipatu (2011) also observed that there existed a gender disparity between men and women participating in environmental training programmes especially in Zambia. In conformity with this, a study by FAO(2011) states that in many countries women are doing the agricultural work and yet benefit from only a small fraction of the training, exchanges and workshops.

Milupi (2008) conducted a research in Chongwe District and focused on the general problems faced by women due to environmental degradation. One of

them was due to unsustainable forms of agriculture. Though the study does not point out whether the women and the entire community were aware of how to alleviate the effects of environmental degradation emanating from unsustainable forms of agriculture through organic agriculture.

Summary of the chapter

The above literature highlighted the negative impact of some farming systems especially conventional agriculture through the excessive usage of chemical fertilisers on the environment and also pointed out benefits of organic agriculture as a solution to sustainability problems being exerted on the environment.

However, literature shows that there seems to be a gap on whether small scale farmers undergo environmental awareness to fully understand the negative impacts of unsustainable forms of agriculture and if they have the knowledge about the benefits of organic agriculture on the environment. This in particular is the focal point of this study.

The above chapter has reviewed some of the relevant literature to the current study and the next chapter will consider the methodology that was used.

CHAPTER THREE: METHODODOLOGY

3.0 Introduction

This chapter discusses and describes the general methodology which was used in the study. It presents the research design, target population and sample size. The sampling procedure, research instruments, data collection, analysis and ethical considerations are other components of the chapter.

3.1 Research Design

The study predominantly employed a qualitative research design. Qualitative research design is a form of research that involves description and seeks to analyze the culture and behaviour of humans and their groups from the point of view of those being studied (Kombo and Tromp, 2011).

The design was applied with a case study approach. Case studies are concerned with a rich and clear description of a phenomenon under study (White,2003). Therefore, the researcher used a case study in order to get an in-depth understanding of the phenomenon under study and get a rich perception of the people under study.

3.2 Target Population

According to Ogula,(1998)a population is a collection of objects, events or individuals having some common characteristic that the researcher is interested in studying. In this study the target population comprised all small scale farmers of Chongwe District in all farm blocks situated within Chongwe District.

3.3 Sample Size

The study comprised a sample of 65 participants from three farm blocks of Chongwe District which are either peri-urban or rural settlement. This comprised one Principal of an agriculture training centre and three agriculture extension officers and 61 small scale farmers. A sample is a number of individuals or objects from a population, containing elements representative of the characteristics found in the entire group (Orodhoand Kombo, 2002).

3.4 Sampling Procedure

The researcher used purposive sampling and Snowballing sampling procedures. Purposive sampling was utilised to help the researcher get participants rich in information relevant to the study. From the 65 participants; one director of an agriculture training centre was purposively sampled because of being within the catchment area. Three agriculture extension officers were also purposively sampled as they were in charge of the area. In addition, three lead farmers were purposively sampled as they were in charge of the sampled areas.

While 58 small scale farmers were sampled using the snowballing method from the three lead farmers and other farmers who knew the area well. Therefore, the total number of small scale farmers sampled was 61. Snowballing is where a researcher benefits from one participant suggesting or introducing another participant to the researcher (Ogula, 1998). Thus, the researcher relied on one source to lead to the other with rich information. From all these categories a total number of 65 respondents were interviewed by the researcher.

3.5 Research Instruments

The study employed two research instruments to collect data from the respondents namely: questionnaires and semi structured interview guides. Questionnaires were used to collect data from small scale farmers. The questionnaires were administered by the researcher and the assistant through interviews with respondents.

This was done with an assumption that the respondents were not able to read and write. The use of the questionnaires with open and close ended questions was used to get an in depth of information from the respondents. Hence the questions were read to the respondents to enhance comprehension of the information.

The researcher further used a semi structured interview guide to collect data. According to Ogula (2008) this type of interview is normally used when it is known that the respondents have been involved in the situations under study and consequently focuses on their experiences regarding the situations. Thus the semi interview guide was used to collect data from officials from a sustainable agriculture college that included extension officers.

3.6 Data Collection Procedure

The first step was to make appointments with relevant officials from the study areas. On appointed days, interview guides were administered to the principal of the agriculture training centre and agriculture extension officers. Then finally, semi structured questionnaires were administered to the small scale farmers.

3.7 Data Analysis

According to Kombo and Tromp (2011) data analysis is the examination of the data that has been gathered in order to make deductions and inferences. Since the study was predominantly qualitative, data analysis began during the data collection process with the arrangement of field notes into related themes according to the set of objectives to facilitate the presentation of findings on the state of awareness about Organic Agriculture of small scale farmers of Chongwe District.

3.8 Validity and Reliability

Validity and reliability was enhanced through the use of a mixture of data collection methods and sources of data. According to Ogula (2008) reliability is a measure of how consistent the test results from a test are. Therefore, the study attempted to achieve reliability through piloting research instruments to six respondents from the study area before finally being administered to the sampled population.

3.9 Ethical Considerations

The researcher adhered to ethical issues in research by firstly seeking written consent from the University of Zambia before conducting research. Permission was also sought from the participants who were later notified about the aims and objectives of the study. Further, the researcher ensured confidentiality of the information collected and anonymity of all the respondents who offered information for the study.

Summary of the chapter

This chapter focused on the methodology that was used to generate and analyze data. The proceeding chapter is a presentation of the findings of the study.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.0 Introduction

This chapter presents findings of the research on the study of small scale farmers' awareness on organic agriculture for a sustainable environment in selected farm blocks of Chongwe District. The research findings were presented under themes from research objectives. The specific research questions which were used to generate themes to present the findings are as follows:

1. What is the nature of farming systems undertaken by small scale farmers in Chongwe District?
2. Are small scale farmers aware of organic agriculture programmes in the area?
3. How is the participation of small scale farmers in training aimed at promoting organic agriculture?

The information presented in this chapter is organized in two parts. The first part dealt with findings from questionnaires administered to 65 respondents from the categories of small scale farmers who were 61 and the 4 officials from the training provider. The other presentation comprised findings for 61 small scale farmers only.

4.1. Farming systems in Chongwe District

This section is a presentation of findings for responses related to the first research question about the nature of farming systems undertaken by small scale farmers in selected farm blocks of Chongwe District. The presentation is from semi structured questionnaires with small scale farmers in addition to semi structured interviews with officials of an agriculture training centre. The first part of the section begins by giving characteristics of the respondents.

4.1.1 Characteristics of respondents

This subsection covered data on the characteristics of the respondents as presented below and is addressed in items 4.1.2 to 4.1.9.

4.1.2 Education status

Table 1 below has indicated that 30 (46%) of the respondents had never been to school, while 9 (14 %) of the respondents had attained secondary education and the least 2 (3 %) of the respondents had attained tertiary education. The distribution of the education status of the respondents is illustrated in Table 1 below.

Table 1: Education Status of respondents

Education Status	Frequency	Percentage
None	30	46
Primary	24	37
Secondary	9	14
Tertiary	2	3
Total	65	100

Source: Field data, 2015

The level of respondents' education was important to this study as it would help design training programmes that would cater for both literate and illiterate farmers in these new farming methods advocated. Having presented the education status of the respondents the next aspect to be considered was gender.

4.1.3 Gender of respondents

Table 2 below shows the gender of the farmers and the two officials from the agriculture training centre. The data collected revealed that the majority of the respondents 37(57%) were women while the rest 28(43 %) were men. Information on the gender of the respondents is shown in Table 2 below.

Table 2: Gender of respondents

Gender	Frequency	Percentage
Males	28	43
Females	37	57
Total	65	100

Source: Field data, 2015

The gender of the respondents was important to the study so that the implementation of the suggested training programmes in organic agriculture would offer equal opportunities for both men and women without any discrimination.

Having dealt with the gender of respondents, the next aspect to be considered was the nature of farming systems undertaken by small scale farmers in the study area which was related to responses from the first objective.

4.1.4 Farming systems in Chongwe District

In assessing the nature of farming systems practised by small scale farmers in the area, the researcher conducted field observations to confirm what farming systems were being practiced.

The data collected regarding the nature of farming systems, revealed that majority of the respondents 41 (67 %) engaged in both organic and conservation farming systems, whereas the other 16 (26%) engaged exclusively in organic farming and the least 1 (1.6 %) of the respondents practiced convention farming only. Table 3 below shows the distribution for the respondents' nature of farming systems.

Table 3: Nature of farming systems

Type of farming system	Frequency	Percentage
Practiced mixed farming systems	41	67.3
Organic only	16	26.2
Conservation only	3	4.9
Convention only	1	1.6
Total	61	100

Source: Field data, 2015

This information was useful in determining whether more training aimed at promoting organic farming is needed to be done for small scale farmers in the study area.

After establishing the nature of farming systems undertaken by the respondents the next aspect to be considered was the respondents' state of awareness about organic agriculture.

4.1.5 State of awareness about organic agriculture

Findings regarding the state of awareness about organic agriculture with small scale farmers are presented in Table 4 below. The data collected revealed that 56(92%) of the respondents acknowledged that they knew about the benefits of organic agriculture for the environment, while 5(8.2. %) of the respondents had no idea about organic agriculture and its benefits. Table 4 below shows the distribution of the responses for the state of awareness about organic agriculture.

Table 4 State of awareness on organic agriculture

Awareness of organic agriculture	Frequency	Percentage
Aware	56	92
Not aware	5	8
Total	61	100

Source: Field data, 2015

The information about the state of awareness about organic agriculture was critical in assessing how much more training aimed at promoting organic agriculture is needed to be done in the study areas for the small scale farmers.

The discussion on the state of awareness about organic agriculture by the farmers was followed by factors that influenced the given farming systems of the farmers in the study area.

4.1.6. Factors influencing farming systems

In connection with findings tabulated in Table 3 above indicating the type of farming practiced, the researcher sought to find out the factors that influenced the given farming systems of small scale farmers in the study area. The farmer who engaged in conventional forms of farming stated that he used chemical fertilisers for his crops in order to maximise crop yield. He further stated that weeds in the fields were easier to manage when herbicides such as weed killer were used.

Respondents who engaged in conventional and conservational farming systems further stated other contributing factors to the choice of conventional and conservation farming such as the use of fertiliser. They said that it was readily given to them through the Fertiliser Input Support Programmes (F.I.S.P) as subsidised inputs were offered by government. It was also observed that small scale farmers mostly cultivated maize due to its being the staple food for most communities.

On the other hand, those who engaged in organic farming claimed that they practised organic farming because it was cheaper and the fertility of the soil was preserved as they only used compost and animal manure for increased yields. In support of organic foods one respondent mentioned the following:

“I engage in organic farming because organically grown foods are healthier and better in taste than those grown using conventional forms of farming.”

4.1.7 Findings from the local agriculture training provider

In line with the findings from the small scale farmers on why they practised organic farming, officials from Kasisi Agricultural Training Centre during an interview with the researcher echoed the following sentiments in support of organic agriculture:

“Organically grown foods are superior in nutrition content to those grown conventionally. This type of food also tastes better as its sugar content is a function of nutrition quality that the plant has naturally enjoyed. Organic foods also stay longer as they are nourished naturally without incurring the cost of expensive agri chemicals which are also hazardous to the environment and health of the people. Most importantly organic farming ensures that soil nutrition is restored by reversing soil degradation.”

This information about factors influencing the choice of farming systems was important to the study in suggesting applicable farming systems in the training activities aimed at promoting organic agriculture.

After dealing with factors that influenced given farming systems, the next items examined were the challenges that farmers faced regarding the given farming systems.

4.1.8 Challenges faced in organic farming

Findings from respondents on the challenges of small scale farmers faced regarding the type of farming systems practised revealed that; those who practised organic farming faced problems with sourcing animal manure as it

was not readily available because very few people had livestock. One respondent mentioned the following:

“I face a lot of problems in accessing animal manure sometimes whereby I am forced to walk long distances looking for it since most of us do not have animals. I am also faced with financial problems because animal keepers instead of just giving us for free they sell their manure. This has really affected my crop yield.”

While others stated that crops grown organically were more prone to pest infestation which made the farming practice labour intensive as they had to often remove weeds manually from their fields and especially those who were advanced in age said that they could only manage to allocate a smaller field to cultivate organic food for their own consumption.

Farmers who grew organic produce further stated that sometimes they faced challenges in selling their products because they were sold at the same price as those grown conventionally therefore, they felt discouraged to engage in the practice.

In addition, respondents stated that output on the crops grown organically was not as much as that of crops grown using conventional types of farming systems, thereby leading them to practice organic farming only on a small scale mainly for crops for home consumption.

Other challenges brought out by the farmers were that they lacked equipment to make natural herbicides to curb pesticides and they also lacked equipment for making tea manure which is a natural soil conditioner that improves the fertility of the soil.

The information on challenges faced by small scale farmers engaging in organic farming was essential to this study in suggesting measures for increased participation of small scale farmers in organic farming for a sustainable environment.

4.1.9 Challenges faced in conventional and conservation farming

Information collected from respondents on challenges small scale farmers faced regarding conventional and conservation farming showed that respondents faced the following challenges: One respondent said the following:

“We face problems with accessing farming inputs because fertiliser and seeds are very expensive and we cannot afford.”

Some respondents mentioned that the government delayed distribution of farming inputs required for the planting season which resulted in poor yields mainly due to poor transport infrastructure such as poor road network.

The other respondents mentioned that there was poor funding for the Fertiliser Input Support Programmes (F.I.S.P) from government which made it difficult to access the subsidized fertiliser. Respondents further highlighted that the use of fertiliser resulted into the soil losing fertility thereby leading them to be dependent on the use of synthetic fertiliser.

The significance of this information was to help in offering solutions to the challenges faced by small scale farmers in the mentioned farming systems and more so prioritize training for organic agriculture which would in turn sustain the environment.

4.10 Perception towards organic agriculture

In relation to findings in table 3 about the nature of farming systems practised, respondents were further asked to state if they thought organic farming was the best farming system. Findings from respondents on the attitude towards organic farming revealed that all the respondents (100%) affirmed that organic agriculture was the best farming practice to the environment.

This was despite the fact that farmers who engaged in organic farming mostly allocated a smaller portion of land for the farming practice due to the challenges given in item 4.1.8 above, while other respondents mentioned that

some farmers did not want to change to other farming systems even after sensitisation and training mainly because of not wanting to try something new.

In addition, other respondents stated that some farmers lacked adequate knowledge about organic farming. The information on the attitude towards organic farming was significant to the study in assessing whether respondents in the study area needed training in suggested farming systems that would sustain the environment.

4.2 Awareness of organic agriculture programmes

This section presents findings about awareness of sensitization programmes in organic agriculture for small scale farmers derived from the second research objective. This is addressed in items 4.2.1 to 4.2.4.

4.2.1 Awareness of organic agriculture programmes

Responses of knowledge about sensitisation programmes on organic agriculture put in place for the benefit of farmers are shown in Table 5. The data revealed that 50 (82%) of the respondents were aware of the programmes in organic agriculture put in place for the benefit of small scale farmers and only 11 (18%) of the respondents were not aware. Responses on awareness of sensitization programmes are illustrated in Table 5 below.

Table 5: Awareness of sensitization programmes

Aware of organic agriculture	Frequency	Percentage
Aware	50	82
Not aware	11	18
Total	61	100

Source: Field data, 2015

4.2.2 Findings from the local training provider

The researcher collected more data on how the local training provider, Kasisi Agricultural Training Centre conducted sensitization programmes to the

farmers and findings through an interview with the research coordinator of the institution revealed the following:

“We have a community awareness policy through hosting of farmer groups from different villages, field days and also offer on farm trainings. In addition, the centre disseminates information on organic agriculture through extension officers who visit the trained farmers regularly and the centre also hosts in house training programmes for any interested farmers.”

After examining the information on the respondents’ knowledge of sensitisation programmes aimed at promoting organic agriculture in the study area the next item to be discussed was the source of information of the respondents.

This information about awareness of sensitisation programmes was vital to the training providers in ascertaining how much more sensitization was to be done on organic agriculture for the benefit of small scale farmers in the study area.

4.2.3 Sources of information

Participants were further asked to state their source of information about the benefits of organic agriculture. Findings revealed that the majority of the respondents 27 (44%) received information about organic agriculture from the local sustainable agricultural centre; while 14 (23%) respondents received the information from church gatherings disseminated by the same local agricultural centre and the least 5 (8.2%) of the respondents had not sourced or received any information about organic agriculture.

No respondent was recorded to have received information about organic agriculture through government extension officers. The distribution of the source of information is indicated in Table 6 below.

Table 6: Sources of information

Sources of Information	Frequency	Percentage
Institutions	27	44
Church gathering	14	23
From neighbours	8	13
Radio	7	12
None of the above	5	8
Village headman	0	0
Govt extension officers	0	0
Total	61	100

Source: Field data, 2015

The above findings were important to the study because the information would help training providers devise training programmes that would be responsive and inclusive for the needs of the small scale farmers of Chongwe.

Having examined sources of information about organic agriculture of the small scale farmers, the next subsection looked at was accessibility of information about organic farming for the farmers.

4.2.4 Accessibility of information

Furthermore, respondents were asked to state whether information about organic farming was easily accessible. Majority of the respondents 45 (73%) mentioned that information about organic agriculture was not easily accessible, while only 13 (22%) of the respondents stated that information about organic agriculture was easily accessible to all the farmers. The distribution for accessibility of information is illustrated in Table 7 below.

Table 7: Accessibility of information

Responses	Frequency	Percentage
Easily accessible	45	73
Not easily accessible	13	22
None of the above	3	5
Total	61	100

Source: Field data, 2015

The information was significant to the study because it would bring out information that could be useful to training providers in devising programmes that would change attitudes towards organic farming practices for a sustainable environment. Information on accessibility of information about organic agriculture was followed by the importance of sensitization programmes in the study area.

4.2.5 Importance of sensitisation programmes

Respondents; farmers and information providers were asked whether sensitization programmes aimed at promoting organic agriculture were important to the farmers. All the respondents affirmed that the programmes were vital for the farmers.

Small scale farmers indicated that awareness programmes in organic agriculture were important in changing attitudes toward organic farming amongst the farming community in ensuring that the fertility of the soil was preserved.

In line with the above response, an official from Kasisi training centre stated the following reasons as to why farmers needed awareness programmes in organic agriculture:

“Farmers are in need of awareness programmes in organic agriculture in order to improve yields sustainably by restoring soil nutrition and reducing soil degradation for the benefit of sustaining the environment.”

The above findings were significant to the study in suggesting easier and accessible ways of offering information aimed at promoting organic agriculture.

4.3 Participation in training programmes:

This is a presentation of results derived from themes related to the third research objective on participation in training programmes for small scale farmers in organic agriculture. This is addressed in items 4.3.1 to 4.3.6.

4.3.1 Participation in training

The findings on participation of farmers in training programmes revealed that 38 (63%) of the respondents participated in all training programmes while the rest 23 (37%) did not participate in all training activities aimed at promoting organic agriculture because of facing challenges highlighted in 4.3.4. Distributions for the above responses are shown in Table 8 below.

Table 8: Participation in training programmes

	Frequency	Percentage
Participated	38	63
Not participated	23	37
Total	61	100

Source: Field data, 2015

The information about the participation of small scale farmers in training was important to the study in ascertaining how much farmers participated in training programmes aimed at promoting organic agriculture and how best those programmes could be improved.

4.3.2 Methods used for training

Findings from oral interviews with the official from the local training provider on what methods were used for training farmers indicated the following:

“As a centre we offer training to farmers using several methods such as indoor training, on farm coaching and demonstrations. Field days are also hosted through the chosen lead farmers who are later expected to disseminate information to the other farmers. In addition, the centre offers follow up extension services to the community. “

The information was important to the study to help facilitators of organic agricultural training in suggesting suitable methods of training.

4.3.3 Challenges faced in accessing training

In relation to challenges faced by small scale farmers in accessing information and training about organic agriculture, data collected from respondents showed that some respondents faced the following challenges:

“Those of us who live far away from the agriculture training centre face difficulties in getting to the centre as we cannot afford transport costs to get to the designated pick up points that get arranged by the centre. This has resulted into most farmers missing out on training meetings. We therefore request that training meetings be held within our villages for all to have access.”

Furthermore, other respondents also stated that visits by extension officers from the training centre were not regular.

4.3.4 Findings from the local agriculture training centre

The researcher had an interview with an official from Kasisi Agricultural Training Centre on the challenges faced regarding offering training to farmers who stated the following:

“We also face challenges in terms of providing training to farmers in terms of funding as we solely depend on international funders and cooperating partners for us to manage the training centre.”

The official further stated that they faced a challenge in conducting regular extension services due to lack of funds for transport and other logistics. This

information was important to the researcher in suggesting better ways of providing training in organic agriculture to farmers in the study areas.

4.3.5 Suggested measures

Data collected in regard to measures to be put in place for small scale farmers to participate in training for organic farming revealed that all (100 per cent) of the respondents suggested that more farmers should be trained and be able to access information.

One respondent mentioned the following:

“Farming inputs such as seed should be provided. We also need empowerment with required equipment like drums for making tea manure and sprayers.”

Respondents also suggested that field visits to the farmers by the extension officers offering training should be regular for farmers to be motivated to continue engaging in organic farming.

Participants also indicated that there should be a more centralised way of offering training by offering more on farm trainings as not all could manage to get to the agricultural centre. Additionally, respondents suggested that the government should also give more support to organic farming other than emphasising more on the usage of chemical fertilisers.

This information was vital to this study for suggesting an improved and inclusive training programme in organic agriculture for a sustainable environment.

4.3.6 Findings from the agriculture training centre

The above findings were also in line with the data collected through an interview with an official from the agriculture training centre who said the following:

“The centre needs more support in terms of funding from the government in order to renovate and modernize our training facilities for us to be able to offer

a quality and more inclusive training programmes in organic agriculture for farmers.”

The official further stated the following:

“The government has no policy related to organic agriculture which implied that the farming system had not been acknowledged and has also not mandated any certifiers of organic products to define standards resulting into organic products being sold at any other price like those grown conventionally unlike in other countries where organic produce was more expensive thereby motivating more to engage in the farming system.”

He further suggested that government should offer organic agriculture training programmes through TEVETA institutions so that access to training in organic farming for small scale farmers is improved.

Summary of the chapter

The chapter presented findings on the small scale farmers’ awareness on the use of organic agriculture in the study area. It was established that majority of the farmers in the study area were aware about the benefits of organic agriculture, though very few of them engaged in the farming system.

In addition, the study established that most farmers had not received training in organic farming a situation which affected practice levels of organic agriculture in the area.

Furthermore, the study established that training providers mainly depended on funding from cooperating partners other than government in the provision of training programmes in organic agriculture. The next chapter presents discussion of the research findings of the study.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Introduction

This section presents the discussion of the research findings that were presented in the previous chapter on small scale farmers' awareness of organic agriculture for a sustainable environment in selected farm blocks of Chongwe District. The main purpose of the study was to assess the state of awareness on organic agriculture among small scale farmers in selected farm blocks of Chongwe District. The themes of the findings were derived from the three research objectives which were;

1. To determine the nature of farming systems undertaken by small scale farmers in selected farm blocks of Chongwe District.
2. To ascertain awareness of organic agriculture programmes in the study area.
3. To establish participation of small scale farmers in training aimed at promoting organic agriculture in the study area.

5.1 Farming systems in Chongwe District

The first objective sought to establish the nature of farming systems undertaken by small scale farmers in selected farm blocks of Chongwe District. This information is addressed in items 5.1.1 to 5.1.9.

5.1.1 Education status

With regard to the education status of the respondents (46%) who were the majority, had not attained any form of formal education and only (37%) had acquired primary education.

The implication of the findings was that the respondents had limited understanding of environmental issues arising from unsustainable forms of agriculture and hence were in need of information and training in organic agriculture required to make informed decisions on the farming systems that

would sustain the environment such as organic agriculture. UNESCO, (2006) supports this assertion that when educational levels are low, sustainability of the environment is often affected through implementation, decision making and quality of life.

Thus, some form of lifelong education is an essential tool in achieving sustainability of the environment in agricultural production. This therefore, calls for the design of applicable training programmes to cater for both literate and illiterate small scale farmers in farming systems of sustainable agriculture such as organic agriculture.

The applicable type of training would give farmers a proper understanding of the effects of environmental degradation that could result from their choice of farming systems. In agreement to this view ,O' Donogue (2007) argues that environmentalists and educators become concerned about the need to do more than raise awareness about issues or provide learners' with fun experiences but more is needed to be done in developing a broad range of methodological processes.

5.1.2 Gender of the respondents

The gender of the respondents in this study had an influence on the implementation of programmes in organic agriculture that would offer equal opportunities for both men and women. As observed from Table 2 of chapter 4, there were more females 57% than males 43% in the study. These findings implied that more women engaged in the training programmes concerning organic farming.

This finding agrees with Chipatu (2011) who also observed that there exist a gender disparity in environmental training programmes between men and women in Zambia. Consequently, there is need to cater for both men and women in training programmes for organic agriculture without any discrimination especially that men are more knowledgeable and traditionally are more practical in general agriculture.

Thus, gender aspects need to be duly taken into account when designing and delivering training in organic agriculture for the programmes to be inclusive and resolve the issues of cultural limitation. In the same line, Almeida and Abreu (2009) adds that unacceptable exposure to pesticides in conventional farming is related to lack of proper education in application and implementation of sustainable agriculture. This could have been caused due to partial training between men and women in such important agriculture national policies.

5.1.3 Farming systems in Chongwe District

Table 3 of chapter 4, has shown that most of the respondents (67 %) engaged in both organic and conservation farming, while only (26%) of respondents practised organic farming only. The other (2 %) of respondents engaged in conventional farming.

The data revealed that a big number of small scale farmers engaged in mixed farming systems where only small portions of land was strictly allocated for organic farming. This implied that the practice levels of organic agriculture were low as compared to other farming systems despite the sound knowledge that these small scale farmers had.

The field data collected through observation and personal interviews also revealed that even those who engaged in organic farming system only allocated a small portion of land where the farmer only grew crops mainly for home consumption. This inferred that there was still a poor attitude among farmers to accept new technology by implementing it into their farming system on large portions of land. Thus, there was need to develop training programmes that would help farmers to change attitudes and acknowledge environmentally sustainable methods of farming that would utilise natural resources and preserve soil fertility.

OPPAZ (2007) agrees with this finding that successful transition to organic farming requires not only a change in farming practices, but also a change in

the farmer's approach in order to learn new management skills and maintain soil fertility.

The findings therefore, indicated the need for encouraging calls from training providers and government to encourage more training and conversion of small scale farmers to organic agriculture.

5.1.4 State of awareness

Findings regarding the state of awareness about organic agriculture presented in table 3 of chapter 4 shows that the majority (92%) of the respondents were aware about the benefits of organic agriculture while the least (8 %) of the respondents had no idea about the benefits of organic agriculture.

This scenario implied that awareness programmes on organic agriculture were conducted in the study area. However, merely being aware about organic agriculture does not indicate that the farmers were actually engaging in the farming system in that the purpose of awareness programmes is the ultimate action that result from such programmes.

In like manner, Qiao et al (2009) note that small holder farmers should be empowered with the benefit of agro-ecology methods for sustainability of their production systems which could be implemented through improved training and extension services.

Therefore, small scale farmers in Chongwe District need regular extension services in evaluating the effectiveness of the awareness programmes in changing attitudes towards organic agriculture. Perhaps the contributing factor with the poor attitude towards organic farming amongst the farmers could have been lack of early childhood training in such farming approaches. In the same line, FAO (2013) acknowledges that despite continued success stories in many parts of the world, organic agriculture has still not entered into formal curricular and extension services remain poor.

It is therefore, hoped that government institutions get encouraged to support organic agriculture as its knowledge is a crucial factor for empowering poor farmers. Thus more is needed to be done by relevant institutions in creating awareness of organic farming as it is crucial for farmers in the sustainable agricultural production and food security of the community and the nation at large.

5.1.5 Factors influencing farming systems

Respondents stated that subsidized farming inputs and chemical fertilisers from government were the major contributing factors in the choice of conservation and conventional forms of agriculture for small scale farmers in Chongwe District.

The farmers who engaged in conventional and conservational farming systems stated that they engaged in the farming systems mainly due to the support from government through the distribution of subsidised inputs even though the prices were still high and unaffordable to many. This implied that the farmers' crop yield would increase with the use of chemical fertilisers though the soil fertility would be negatively impacted.

Hence sustaining soil fertility would play a pivotal role in sustaining crop yield required for food security for the farming community in Chongwe and other farm blocks. Hermansen (2010) agrees with this, that it is at the farming stage that the differences between organic and conventional production were to be determined. Therefore, it is important to understand the different impacts of organic production and conventional foods at the farm gate. This implied that farmers who were producers needed to be aware of the sustainable farming techniques.

As a result some respondents who engaged in conventional farming acknowledged soil degradation resulting from the use of chemical fertilisers, though they still engaged in the farming system because of the higher yield of crops. Other respondents also confirmed that they still used conventional

method because they had not been sensitised on dangers that could result from using chemical fertilisers and hence needed awareness campaigns on a more sustainable form of agriculture such as organic farming.

It is in light of the above findings that Saasa (2003) supports the claims of the respondents that agricultural subsidies have been considered by donors to be causing serious distortions and inefficiencies in the national food production system. Thus farmers are in need of sensitization programmes in organic production that promotes avoidance of synthetic fertilisers, pesticides and encourages crop rotation which replenish the soil with nutrients.

Respondents further mentioned that they mostly cultivated maize because it is the staple food in their communities, a situation which has resulted into low productivity due to lack of crop diversification. As Schoenherr (1992) observed, over promotion of a monoculture form of agricultural production could result in land devastation. Therefore, small scale farmers in Chongwe District were in need of environmentally friendly farming systems such as organic agriculture that embrace crop diversification which in turn reduces the impacts of climate change on the environment.

The above findings also indicated that government through some of its policies had over promoted the use of chemical fertilisers in an attempt to increase agricultural productivity. Almeida and Abreu (2009) noted that the unacceptable exposure to pesticides in conventional farming is related to lack of proper education on implementation of sustainable forms of agriculture.

Exposure to pesticides could have negative effects to the farmers handling them especially that most of them are unaware of the consequences of using pesticides on the crops other than the ultimate increase in crop production. Thus government need to place an emphasis on training small scale farmers in organic agriculture other than over promoting the use of chemical fertilisers through some of its agricultural policies. Parrot and Marsden(2002) agrees with

the above assertion that promotion and maintenance of agro-biodiversity is also considered one of the key elements of organic agriculture.

On the other hand, farmers who practised organic farming mentioned that the farming system was cheaper as compared to buying fertiliser as the cost of animal manure was cheaper than that of fertiliser. The information collected therefore indicated that farmers engaged in organic farming because it was cheaper to use manure in their fields than using chemical fertiliser. However, the challenge would be on the availability of animal or chicken manure as most small scale farmers had no livestock of their own to provide them with manure. This would mean that such farmers' crop yields could drop drastically.

In agreement with the above findings Darnhofer (2010) affirms that little is known regarding to what extent organic farmers seek to exclusively follow the principles of agro ecological methods. Hence follow up extension services are needed to ensure that small scale farmers in Chongwe District are aware of all the principles of organic agriculture other than that of only using livestock manure.

Other farmers also went to say that organic produce was healthier as opposed to conventional foods which they claimed posed health risks from the chemical fertilisers and pesticides. Dooge (1997) has observed that educational efforts on interactions between farmers and the environment need to be expanded to an even greater extent at all levels for small scale farmers to have a greater understanding of the effects that could arise from their choice of farming systems.

Therefore, there is need for small scale farmers to be trained in organic farming as it is a cheaper and sustainable form of agriculture for the resource poor farmers in Chongwe District and the rest of the country. In order to achieve sustainable food security and endeavour to improve soil quality by reducing water and air pollution.

5.1.6 Challenges faced in organic agriculture

With regard to responses on what challenges were faced by farmers who practised organic farming findings showed that respondents faced challenges with sourcing animal manure as very few owned livestock which resulted into a lesser amount of farmland being dedicated to organic agriculture. This finding indicated that farmers lacked adequate knowledge about the farming concept of organic agriculture as their responses implied that organic farming only involved the use of animal manure.

In contrast to the respondents assertions Stockdale et al (2001) argues that, besides using farmyard manure, organic farming also integrates techniques such as composting; crop rotation, inter cropping, crop residue return, straw residue return and mulching. These production techniques are therefore, combined with plant and animal residue for the main principal of soil fertility and water conservation. Thus, organic agriculture involves more than the use of animal manure but a holistic farming system that tries to sustain available renewable resources.

Parrot (2006) in addition affirms that documentation on the use of organic principals and agro-ecological methods is scarce. Therefore, it is important that sensitisation on organic farming should be holistic so that it enables small scale farmers employ other techniques in preservation of the soil structure. This could only be achieved with consented effort with government, private partners and local small scale farmers.

Hence farmers need more information about organic agriculture through training for them to be able to make informed decisions about how to practice one of the best farming practices in sustaining the environment.

Other respondents mentioned that organically grown crops were more prone to pests than those grown conventionally, therefore had difficulties in eradicating them. In contrast with the above finding Smith et al (2011) argues that organic agriculture actually reduces the risk of total production losses due to climate

change impacts such as pest and disease outbreaks including the severity of plant and animal diseases especially through crop diversity.

Respondents further pointed out that organic farming was too labour intensive. Since conventional farmers received support through subsidies from government and organic farmers tend to receive nothing the situation could be reversed to enable farmers engage in the farming system smoothly in the interest of sustaining the environment.

5.1.7 Challenges faced in conservation and conventional farming

As observed from findings in item 4.1.9 of chapter 4, respondents who engaged in conservation and conventional forms of farming mentioned facing a number of challenges such as irregular extension services, delays by government in distribution of farm inputs and high cost of farming inputs such as fertiliser. This claim entailed that small scale farmers' crop yield was usually adversely affected since they heavily depended on the chemical fertiliser provided by the government.

Hence government needed to encourage small scale farmers to engage in the type of farming system which did not require long distances to transport inputs and utilised available natural resources which would preserve soil fertility and was also less costly such as organic agriculture. In support of the above, Twarog (2004) pointed out that despite the overwhelming evidence on the wide range of benefits for organic farming, few governments have adequately supported the farming system. The study further suggested that the responsibility of governments should be to act in the interest of the farmers and the environment by setting framework and incentive structures in implementing supportive policies and regulate markets. They can also provide information and bring stakeholders together.

In this study it was clear that respondents needed to be trained in sustainable forms of agriculture such as organic agriculture that could prove to be cheaper than relying on expensive chemical fertilisers. As illustrated earlier, there also

exists a gender inequality between men and women among agricultural households in the study area.

In support of this MOFED (2002) notes that despite a predominance of women in agriculture, their participation in commercial production is inhibited by lack of access to production inputs such as land, capital and extension services. Thus small scale farmers especially women are in need of knowledge and government support through training in organic farming which has the potential to significantly increase yields while maintaining soil nutrition.

5.1.8 Perception towards organic agriculture

In relation to attitude towards organic agriculture the majority of the respondents inclusive of those who were not engaging in organic farming recommended organic agriculture as one of the best farming practices in achieving the sustainability of the soil and most of all, the environment. This finding was a clear indication that given the necessary support required from the government, training providers would offer an all inclusive training programmes for small scale farmers in Chongwe District which would result in the implementation of organic agriculture for a sustainable way of farming.

Thus advocacy towards organic farming amongst small scale farmers who are the majority is pertinent in achieving sustainable food production. Sahota (2011) agrees with this finding that populations in general are becoming more conscious of their health and environmental issues and thus are worried about the health consequences of conventional agriculture and ingesting pesticides and are thereby buying safe, healthy food produced in an environmentally and animal welfare- friendly manner.

The researcher however, observed that farmers who engaged in the farming system mostly allocated a small portion of land for organic produce mainly for home consumption, while others still engaged in other forms of agriculture such as conservation farming which is also another form of sustainable agriculture. Therefore, farmers in Chongwe are in need of encouragement to

fully convert to organic farming as it has more demonstrated benefits than conventional farming methods.

And as such, Twarog (2004) acknowledges that organic agriculture faced a challenge in changing mindsets and powerful vested interests of small scale farmers. And as such, there is need for training providers to emphasize more on attitude change toward organic farming systems as the evidence clearly showed that not all farmers practised organic farming even after been sensitised and trained.

5.2 Awareness of organic agriculture programmes

The second objective of the study was aimed at ascertaining awareness of organic agriculture programmes in the study area. The discussion is presented in items 5.2.1 to 5.2.4.

5.2.1 Awareness of organic agriculture programmes

The study revealed that majority of the respondents (82%) were aware of the sensitisation programmes in organic agriculture disseminated through various means and only (18%) were not aware. These results showed that there was no relationship between the levels of knowledge and the practice levels of organic agriculture programmes in the area, as evident from the low percentage of respondents of (26%) that were engaging in the farming system. The high number of respondents who were aware of the sensitisation programmes were an indication that farmers were aware of the programmes offered but opted not to get involved. As observed from item 4.1.4 of chapter 4, most respondents did not engage in organic farming though they were aware of its benefits. JCTR (2009) also observed that there exists a discrepancy in terms of practice and the level of knowledge about organic farming. One of the contributing factors for this could be that farmers in the area did not want to change their attitudes in terms of their choice of farming systems.

Correspondingly, Rosenberg (2010) has shown that awareness campaigns do not always lead to the intended action as often people are aware of an issue but

other factors prevent them from successfully acting on it. For this reason, follow up awareness campaigns with practical activities through regular extension services are vital in changing attitudes towards organic agriculture amongst small scale farmers in the area.

Therefore, there is need for government and training providers to do more in advocating for small scale farmers to engage in organic farming for the sustainability of the environment.

5.2.2 Sources of information on benefits of organic agriculture

In regard to sources of information about organic agriculture, research findings showed that(100%) of the respondents got information from Kasisi agricultural centre which was the local sustainable agricultural centre run by a non-governmental organisation fostering sustainable forms of agriculture to the local community disseminating information through various means.

Pretty et al (2006) affirms this finding that many NGOs and developmental organisations introduce agro-ecological methods to small holder farmers in rural communities.

To the contrary, there was no mention of government disseminating information about organic agriculture which clearly showed that government had left the responsibility to nongovernmental organisations.

Therefore, the implication of this finding was that government needs to take an upper hand in training small scale farmers in organic agriculture rather than leaving the responsibility to non-governmental organisations as it would prove cheaper than conventional agriculture and more sustainable for the environment.

This finding was in line with the assertion by Twarog (2004) that despite overwhelming evidence on the wide range of benefits of organic agriculture and other forms of sustainable agriculture, few governments are actively and

adequately supporting the development of this form of agriculture in many countries. Evidently this is not the case in Zambia as the findings revealed.

Hence the government clearly needs to do more in terms of technical support to non-governmental organisations and other institutions involved in the fostering of organic agriculture as it would not only be to its benefit but more so the environment.

5.2.3 Accessibility of information

Dissemination of information about organic agriculture regularly was established to be poor for the majority (73%) of the respondents in this study. As a result, respondents suggested that extension visits be more regular for farmers to be motivated to continue practising organic agriculture as had been observed earlier, farmers mostly allocated a small portion of land for organic farming.

Only (22%) of the respondents had regular access to information due to it being disseminated through the few lead farmers who were trained. The least (5%) of the respondents had not heard about organic agriculture at all. And therefore it was suggested that for other farmers to have access to information it should be disseminated through village headmen as such information would be taken seriously from them than from their fellow farmers. Agreeing to this finding, NOGAMU (2006) observes that sustainability of farmer groups were more likely assured when they work with their own facilitator chosen amongst them rather than a facilitator who worked from an organisation even when locally based.

The research findings therefore confirmed that small scale farmers in Chongwe had accessed information about organic agriculture but merely needed motivation through extension visits from external facilitators to be fully involved with the local lead farmers in organic training programmes for their farming activities to be sustainable.

It is therefore not surprising that the respondents' claims agreed with other studies conducted by Muller (2011) who affirms that organic agriculture was an information intensive system and measures regarding extension services and training needed to be implemented for organic farming to be effective.

5.2.4 Importance of sensitization programmes

The data collected from respondents on the importance of sensitisation programmes in organic farming indicated that farmers felt the programmes were vital in changing attitudes towards organic agriculture.

This was more so for those respondents who engaged in conventional farming systems who claimed that they engaged in the farming system mostly because of the free inputs and subsidized chemical fertilisers from the government for the supposedly increase in their yield. These responses showed that respondents received the fertilisers without being made aware of the negative effects that could result from overuse of the synthetic fertilisers to their health and environment and hence needed training in organic farming.

The findings hint to the fact that government does not offer awareness programmes on the usage of herbicides and pesticides to small scale farmers. Hence farmers are in need of information and knowledge about the negative effects of the subsidized provided fertilisers and herbicides in conserving agricultural land.

In light of the above findings, WCED (1987) noted that agricultural productivity should be based on better controlled application of agrochemicals as well as on more extensive use of organic manures and non chemical means of pest control.

In the same manner, Ediriweera (2007) states that conversion to organic agriculture can improve farmers' access to food for a longer period and reduce risk of indebtedness in case of crop failure. Hence the government needs to do more in offering support to farmers to access information about organic

agriculture for the preservation of natural resources rather than over promote synthetic fertilisers.

5.3 Participation in training programmes

The third objective of the study was to establish participation of farmers in training aimed at promoting organic agriculture. This is addressed in items 5.3.1 to 5.3.4.

5.3.1 Participation in training

Findings on participation of farmers in training programmes revealed that only (37%) of the respondents participated in training activities offered by local training providers. The remaining (63%) did not. This finding was an indication that training providers faced challenges in offering training. The findings further showed that more farmers needed to have access to training in organic farming for them to engage in sustainable farming practices for the sustainability of the environment.

FAO (2005) agrees with this finding that small holder farmers especially the resource poor are not receiving adequate extension and advisory services due to inability of relevant actors in meeting their demands. Panneerselvam (2011) also consents to the above that organic agriculture requires training, capacity building and inputs such as seeds and composting materials which are limiting factors in attaining sustainability if not provided by concerned government ministries.

Thus the government needs to give promoters enough support that would enhance access to knowledge and training for farmers to increase productivity and in turn sustain the available natural resources in Chongwe.

5.3.2 Methods used for training

The researcher sought to find out the methods used in offering training from the training providers. This information would help to assess if the methods used were appropriate to the small scale farmers in the community. As observed from the responses from Kasisi Agricultural Training Centre,

methods such as indoor training, on farm coaching with lead farmers and field days were used to train small scale farmers in organic agriculture.

A core concept in these training programmes was sustainable agriculture such as organic agriculture, which emphasizes the economy of resources in pursuing acceptable yield while concurrently conserving and protecting the environment.

This idea is supported by Preety et al (2006) who note that, many NGOs and development organisations introduce agro-ecological methods to small holder farmers through farmer field activities. Thus, training small scale farmers in organic agriculture had the potential to improve yields and restore the fertility of the soil.

5.3.3 Challenges faced in accessing training

In relation to accessing information and training about organic agriculture, the researcher sought to find out if the respondents faced any challenges. Research findings revealed that training providers offered training programmes in organic farming through the use of various methods. However, small scale farmers in the area mentioned facing challenges in accessing training. As observed from the findings, respondents who lived far from the training centre mentioned having faced challenges in accessing training programmes in organic agriculture due to lack of transport from the farm blocks to the designated pick up points set up by the training centre and therefore suggested that training programmes should be hosted within their communities to make it easier for all farmers to have access to training.

And as such, training providers in the research area acknowledged that despite the consistent delivery of training programmes in organic agriculture at the centre, the long term financial sustainability rested on the ability to derive income from the crops produced and funding from cooperating partners. This is in line with the statement by Saasa (2003) who had noted that poor funding to the non-governmental organisations providing training in sustainable

agriculture had compromised their effectiveness in effectively disseminating information to the farmers. Thus the data collected indicated the need for government to step up support to non-governmental organisations involved in the fostering of organic agriculture for them to effectively offer training and information to small scale farmers in Chongwe.

Other respondents also complained of the irregular extension visits. Information collected on the given methods of teaching affirms that there is need for divergent methods to be used in offering effective training to small scale farmers in organic agriculture to enable accessibility of information to be inclusive to all small scale farmers in Chongwe.

Regrettably a study by Morgan and Murdoch (2000) revealed that organic farming is a political struggle as it has not been prioritized by most governments in terms of policy support. Lack of support from government could prove retrogressive to the development of sustainable development. It is therefore government's responsibility through relevant ministries such as the Ministry of Agriculture to support training providers of organic agriculture in achieving a sustainable environment for small scale farmers in Chongwe and other parts of the country.

5.3.4 Suggested measures

As earlier stated, small scale farmers faced challenges in accessing training and information in organic agriculture. Consequently, some respondents suggested that training in organic agriculture be offered within the vicinity of the villages to enable full participation from the farmers. In addition research findings implied that small scale farmers in the farm blocks of Chongwe District felt that government should not only offer financial support to conventional farming but also do so to organic agriculture.

Nevertheless, training providers claimed that provision of training and information about organic agriculture mainly relied on funding from cooperating partners and thereby needed support from government to run the

programmes effectively. This assertion was in line with a study by JCTR (2010) which showed that organic farming had not been acknowledged by the government of Zambia and that it was only implied in the sense that since the government supported conservation farming then it also included organic farming which was not the case as the two farming systems were totally different from each other. Hence research findings established that there was need for the government to acknowledge organic farming in its agricultural policies for more farmers to engage in the farming system.

In addition, Morgan and Murdoch (2000) acknowledge that organic farming is both a technical management strategy and a political struggle in most countries. Therefore, measures suggested by the respondents in this study indicated that organic agriculture had not been prioritized in terms of policy by the government. This is because funding for the sector mainly relied on cooperating partners.

As a result, organic agriculture may not fulfill its aim of environmental sustainability. To this end organic agriculture needs affirmative action from government for not only rural development but also sustainability of the environment.

Summary of the chapter

The chapter discussed findings whose themes were derived from the three main research objectives. Assessing small scale farmers' awareness on organic agriculture was imperative in understanding needed interventions required for effective implementation of organic agriculture programmes in achieving a sustainable environment and food security for small scale farmers in Chongwe District.

The next chapter is a presentation of the conclusion and main recommendations of the study and suggestions for future research.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusion and recommendations of the study based on the findings and discussion on small scale farmers' awareness on organic agriculture for selected farm blocks in Chongwe District.

6.1 Conclusion

The study was based on the following three objectives

1. To determine the nature of farming systems undertaken by small scale farmers in selected farm blocks of Chongwe District.
2. To ascertain awareness of organic agriculture programmes in the study area.
3. To establish participation of small scale farmers in training aimed at promoting organic agriculture in the study area

To begin with, the first objective and research question of the study attempted to establish the nature of farming systems undertaken by small scale farmers in selected farm blocks of Chongwe District. Findings of the study revealed that adoption of organic agriculture in the area was found to be lower than the other farming systems. Nevertheless, it was noted that even those respondents who engaged in organic farming only allocated a small portion of land for the produce.

Furthermore, the second objective sought to ascertain awareness of organic agriculture programmes in the area. The study established that majority of the respondents were aware of the programmes in organic agriculture disseminated through various means by a local sustainable agricultural centre. Hence this finding affirmed that there was no relationship between the high levels of knowledge and the performance levels of organic farming in the area as evident from the findings.

Finally the third objective brought out issues pertaining to participation of farmers in training aimed at promoting organic agriculture in the study area. The study revealed that the sole information provider in the area about organic agriculture was Kasisi Agricultural Training Centre, run by a nongovernmental organisation.

Another important aspect which was highlighted in the study was the fact that government did not offer any financial support to the institution.

Henceforth, this led to the conclusion that government did not offer any training to small scale farmers in the area. With regard to the above, the analysis showed that participation of small scale farmers in training aimed at promoting organic agriculture was low as respondents cited facing challenges in accessing training.

6.2 RECOMMENDATIONS

The recommendations are derived from the findings of this research. Therefore, the study first highlights the actual finding then suggests the recommendation.

a) The findings of the study revealed that adoption of organic agriculture practice in Chongwe was found to be lower than the other farming systems. Therefore, it is recommended that government needs to prioritise organic farming in its agricultural policies in order to enable full participation amongst small scale farmers in organic agriculture for a sustainable environment.

b) The data collected revealed that government does not offer any training in organic agriculture and more so does not offer any financial assistance in assisting with training to the non-government organisations that foster organic agriculture. It is therefore recommended that to enhance organic farming practices financial support is needed from the government to training providers fostering organic agriculture for the farming system to be sustainable, as most promoters depended on funding from other cooperating partners. That would entail full participation of small scale farmers in training programmes for organic farming.

c) The study established that only non-governmental organisations offered training in organic agriculture to small scale farmers in Chongwe District. Therefore, it is recommended that additional tertiary institutions should be created to train agriculture extension officers in organic farming. These trained extension officers would enhance organic farming in the farming blocks of Chongwe and other parts of Zambia that still lack this kind of training.

6.3 Suggestion for future Research

This research should be seen as the starting point for this kind of study hence it has not been conclusive in its findings. There is still room to undertake other related research topics in future such as:

- a) An assessment of the effects of conventional agriculture on small scale farmers in rural communities.
- b) An assessment on the workability of government extension officers in terms of organic farming.
- c) An assessment of the government's sustainable agricultural policies for small scale farmers.

REFERENCES

- Almeida, G.F. and Abreu, L.S de .(2009) .‘Estrategias produtivas e aplicacao de principios da agroecologia: o caso dos agricultores familiares de base ecologica da cooperative dos agropecuaristas solidarios de Itapolis – COAROSOL’ *Revista de Economia Agricola*, 56, 1 pp. 37-53
- Beban, A. (2008).Organic agriculture: An empowering development strategy for small- scale farmers. A Cambodian Case study, Master Dissertation, , Palmerstone North: New Zealand Massey University .
- Bolwig, S., and Odeke, M.(2007).Household food security effects of certified organic export production in tropical Africa-Gender analysis. Bennekom: EPOPA publication.
- Civil Society Environment fund . (2013). Growing Green,Helsinki: Ministry of Foreign Affairs, Finland.
- Chipatu,L.(2011).Environmental education to address negative impacts of copper mining in Kankoyo township of Zambia Copperbelt region,M ed Dissertation .Lusaka:University of Zambia.
- DANIDA .(2011).*Civil Society Fund*.Helsinki: Ministry of Foreign Affairs of Finland.
- Darnhofer,I.(2010)Conventionalisation of organic farming practices: from structural criteria towards an assessment based on organic principles. Geneva:Report for agronomy for sustainable development.
- Dooge, J.C.I, Goodman G.T, La Rivie’ra J.W.M, Brennan M. (1992). An Agenda of science for environment and development into the 21st century, Cambridge ,UK: Cambridge University Press.
- Dorward, A. and Poulton, C. (2008). The global fertiliser crisis and Africa, Briefing paper. Future agriculture consortium. Accessed at www.future-agriculture.org,accessed 20/01/2015.

ECZ.(2000) State of the environment in Zambia 2000.Lusaka: ECZ.

ECZ.(2000)Zambia Environmental Outlook Report 3, Lusaka: ECZ.

ECZ.(2008) Zambia Environmental Outlook Report 3, Lusaka:ECZ.

Edward R. (2010). 'Successes and challenges in ecological agriculture, experiences from Tigray, Ethiopia'. Rome: FAO, .

Eyhorn, F.(2007). Organic farming for sustainable livelihood in developing countries; The case of cotton in India, Phd Dissertation, Department of philosophy and science.Switzerland. University of Berni. Accessed on 23/03/13.www.sb.unite.ch.

FAO.(2005).An introduction to the basic concepts of food security, FAO food security programmeRome: FAO.

FAO.(2011). 'The State of Food and Agriculture 2010-11, Women in Agriculture Closing the gender gap for development', Rome:FAO

FAO.(2013). Organic Agriculture : African Experiences in Resilience and sustainability, Natural Resources Management and Environment Department of food and Agriculture Organisation of the United nations; Rome ,FAO.

FAO.(2005).'FAOSTAT database', <http://faostat.fao.org> .Rome :FAO. Accessed on 22/07/13 at 23:10.

FAO .(1990) .Report of the International Conference on Organic Agriculture and Food Security, Rome :FAO

FAO (2005).FAOSTAT 'database', <http://faostat.fao.org>Rome: FAO (accessed on January 15, 2005)

FAO(2008b).'An introduction to the basic concepts food security', FAO food security programme, Rome: FAO.Available at www.foodsec.org/doc/concept/guide.pdf.

GRZ (1992).A framework for Agricultural Policies to the year 2000 and Beyond,Lusaka : MAFF.

Halberg N. (2010). Impact of organic pig production systems on CO2 emissions, C sequestration and nitrate pollution,' Agronomy for Sustainable Development ,London: Roulledge.

Halberg,N and Muller, A .(2013)Organic agriculture for sustainable livelihood, London: Roulledge.

<http://www.farmlandlp.com> accessed on 20/08/14.

<http://www.universityofcalifornia.edu/news/bringing-plant-back-extinction>
accessed on 27/03/13.

IAASTD .(2008).International Assessment of Agriculture Knowledge, Science and Technology for Development; Global Report, UNDP, FAO, UNEP, UNESCO . Washington DC: The World Bank, WHO, Global Environment Facility.

IFOAM.(2005). 'Social Justice', IFOAM Basic Standards, Chapter 9, International Federation of Organic Agriculture Movements. Bonn:IFOAM.
www.ifoam.org/aboutifoam/standards/norms.html

IFOAM. (2005). Position on the full diversity of organic agriculture.Bonn:IFOAM Available online;
<http://www.ifoam.org/press/positions/organicagriculture.html>

IFOAM .(2011). 'Participatory Guarantee systems', International Federation of Organic Agriculture Movements.Bonn: IFOAM
www.ifoam.org/about_ifoam/standards/pgs.html

IFOAM.(2004) .Position on the full diversity of organic agriculture,Bonn:IFOAM. Available online;
<http://www.ifoam.org/press/positions/organicagriculture.html>.

JCTR.(2010).Study on knowledge, Attitudes and Practices (KAPs) on Conservation and Organic farming in Zambia,Lusaka: Jesuit Centre for Theological Reflection.

KATC.(2011). Study on Knowledge and Practices (KAPS) on Conservation and Organic farming in Zambia.Lusaka: Jesuit Centre for Theological Reflection.

Kombo, K.D and Tromp, L. A.(2011). Proposal and thesis writing; An introduction. Nairobi; Paulines publications of Africa.

Lokerreiz,W.(2007). Organic Farming: an International History. Massachusetts:Tuft University Boston.

Lynch,D.H.(2011). 'Environmental impact of organic agriculture: a review with special reference to North America'. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources, 7, 10 pp. 1-17

Matson,P.A.(1997). 'Agriculture intensification and ecosystem properties'. Science 277, 5325, pp. 504-509.

Milupi, I .(2008).Environmental education activities among Chongwe rural women of Zambia arising from environmental degradation of their area, M. ed Dissertation, Lusaka. University of Zambia.

MOFED. (2000). Economic Report. Lusaka:Ministry of Finance and Economic Development, Zambia.

MoFNP. (2006). Annual Reports. Lusaka: Ministry of Finance and National Planning.

Morgan, K and Murdoch J.(2000). 'Organic vs. conventional agriculture knowledge power and innovation in the food chain' *Geoforum*, 31, pp. 159-173

Mueller,A (2011) ‘Mitigating greenhouse gases in agriculture – a challenge and opportunity for agricultural policies.Geneva:Report commissioned by ‘Brot fur Welt’ (Germany), ‘Brot fur alle’ (Switzerland)

Mweemba L.(2009). Environmental self efficacy, attitude and behavior among small scale farmers in Zambia, Department of Environmental sciences and engineering. Hubei: Huazhong University of science and Technology.

O’Donogue, R .(2007).Environmental education ethics and action in Southern Africa,Pretoria; EFASA Monograph, HSRC.

Ogula, P.A (1998) A handbook on educational Research: Nairobi: New kemit Publishers.

OPPAZ .(2007).African Organic Farmers; Field crop manual .Farming and Marketing of organic crops in Zambia, Southern and Eastern Africa. Lusaka:OPPAZ.

Orodho and A.J.,and Kombo,D.K .(2002).Research methods. Nairobi: Kenyatta University, Institute of Open learning.

Orsolya, E .(2010). Sustainability and organicfarming in the light of conventions theory. Sweden: Stockholm University.

Oldeerman, L. (1991). Global Assessment of soil degradation.Geneva: ISRIC/UNEP study.

Rosenberg ,E .(2008).Towards better environmental sustainability practices :Methods and processes to support change-oriented learning.Grahamstown:Rhodes University Press.

Palmer, J.A (1998) Environmental education in the 21st century ; Theory, Practice, Progress and Promise, London: Rout ledge.

Panneerselvam, M. (2011a). Food security of small farmers: comparing organic and conventional systems in India, *Journal of sustainable agriculture*, 35 pp 157-169.

Parrot, N. and Marsden, T.(2002). 'The real Green Revolution: organic and agro ecosystems: a new conservation paradigm.NY:Animals of the New York Academy of Sciences, 1134, 1, pp. 173-200.

Preezy, J.N.,Noble,A.D,Bossio,D.,Dixon,J.,Hine,R.E,Penning,de Vries,F.W.T. and Morrison,J.I.L..(2006). Resources conserving agriculture increases yields in developing countries, *environmental science and technology*, 40, 4, pp 1114-1119.

Qiao,Y.,Setboonsarng,S.and Halberg,N.(2009). 'PCR country study on organic agriculture and the Millennium Development Goals', Asian Development Bank Institute Working Paper.

Ramakrishnan, M and Panneerselvam, A.(2005).*Environmental science education*, New Delhi :Sterling publisher private limited.

Saasa O.S,(2003).Agricultural Intensification in Zambia; The role of Policies and Policy processes-Micro Study, Institute of Economic and Social Research. Lusaka: The University of Zambia.

Sahota,A.(2011).The global market for organic food and drink', in H.Willer and L Kilcher (eds),*The World of organic Agriculture :Statistics and Emerging Trends 2011*,Frick:FiBL;Bonn:IFOAM.

Schoenherr,A. (1992).A Natural History of California.Berkely : University of California Press.

Sciallaba N.(2007).Organic Agriculture and food Security.' OFS/2007/5, Food and Agriculture Organisation of the United Nations Rome.:FAO.

Smith, K.(2011).Negotiating Organic,Fair and Ethical Trade: Lessons from Smallholders in Uganda and Kenya’, in C. Campbell, C. Rosin and P. Stock (eds), Food Systems Failure, London: Earthscan, pp. 180-199

Soil Association. (2007).‘Should the Soil Association tackle the environmental impact of air freight in its organic standards?’.UK: Soil Association Standards Consultation – Air Freight Green Paper.

Stockdale,R.E.A.,Lampkin,,N.H.,Hovi,M.,Keatinge,R.and Lennartsson,E.K.M.,.(2001).Organic farming systems ‘Advances in agronomy,70,pp.261-262.UK:Cambridge Press.

(WCED).(1987).The World Commission on Environment and Development,Palais Wilson, Geneva: Oxford University Press.

Torjusen,T .(2004).Subscription of organically produced food in a food system perspectiveCopenhagen ; ESA workshop.

Turner,K.(2004).‘Economic valuation of water resources in agriculture’, FAO paper reports No. 27,Rome: FAO.

Twarog, S.(2004).‘Preserving, protecting and promoting traditional knowledge: national actions and international dimensions’, in S.Twarog and P. Kapoor (eds), Protecting And Promoting Traditional Knowledge: Systems, National Experiences And International Dimensions.New York and Geneva :

United Nations.

Twarog, S. (2006).‘Organic agriculture: a trade and sustainable development development opportunity for developing countries’, in UNCTAD, Trade and environmental review 2006. New York and Geneva: UN.www.unctad.org/endocs/ditched200512_en.pdf

UNEP .(2011).‘Agriculture: investing in natural capital. Geneva: Green Economy Report.

UNEP/UNCTAD .(2008).Organic Agriculture and food security in Africa.Geneva: United Nations Environmental Programme. www.unctad.org/en/docs/ditcted_200715.

UNESCO.(1987).Draft implementation scheme decade of sustainable development,Paris: UNESCO. <http://portal> accessed on 23/04/15.

UNESCO.(2006) .Education for Sustainable Development in Action Learning. Paris: UNESCO.

White, C.J. (2003).Research methods and techniques. Pretoria: Mustung.

Willer, H. and Klicher, L. (eds) .(2011).The Worlds Of Organic Agriculture-Statistics And Emerging Trends 2011, Bonn and Fick: IFOAM and FiBL.

Zanoli, R(ed).(2004). The European consumer and organic food, organic marketing initiatives and rural development.Aberystwyth : University of Wales..

ZEMA. (2012).The Enviro-Line. Lusaka:Environmental Council of Zambia.

Zhao, Q. (1990).Land degradation, Acta pedologica Sinica,25.No.4

APPENDICES

APPENDIX 1

INTERVIEW GUIDE FOR GOVERNMENT AND TRAINING PROVIDERS OF ORGANIC AGRICULTURE TO SMALL SCALE FARMERS IN CHONGWE DISTRICT

1. Name of institution.....
2. Position held.....
3. Does your institution have any policy framework on environmental sustainability for small scale farmers?
4. How many farmers groups or cooperatives do you train?
5. What programmes do you offer for the benefit of the farmers in organic agriculture?
6. What methods do you use to educate farmers on environmental sustainability through organic agriculture?
7. What are the main topics covered in organic agriculture?
8. Are there other organisations that have supported you in implementing activities aimed at promoting environmental sustainability through organic agriculture?
9. What is your general assessment of farmers' participation in organic agriculture?
10. What are the requirements for farmers to be trained by your organisation?
11. What challenges do you face in carrying out training activities in organic agriculture?
12. How do small scale farmers access information about the activities of your institution?
13. Are there any cultural beliefs of small scale farmers that may have an impact on the training that you offer?

14. How have you managed to reach out to the immediate communities to sensitize them on environmental sustainability through organic agriculture?
15. What are your future plans on sensitization of small scale farmers?

APPENDIX 2

QUESTIONNAIRE FOR SMALL SCALE FARMERS OF CHONGWE DISTRICT

Section A: Background Information

1. Gender:

1. Male [] 2. Female []

2. Marital Status

1. Single [] 2. Married [] 3. Divorced [] 4. Widowed []

3. Your Highest Education qualification?

1. Primary []
2. Secondary []
3. Tertiary []
4. No education []

Section B: Nature of farming systems

4. What is the name of your farming community?

.....

5. What kind of farming systems do you engage in?

.....

.....

6. Mention the factors that have influenced the choice of your farming systems? Explain:

.....

.....

.....

7. Have you faced any challenges related to the given farming systems?

1. No [] 2. Yes []

8. If the answer to the above question is yes, mention any challenges you have faced related to the use of either chemical fertilisers or organic manure?

a) Chemical fertilisers.....

b) Organic manure.....

Section C: Awareness of sensitization programmes in organic agriculture for small scale farmers in the area

9. What kind of fertilisers do you use to increase yields on crops in your area?

.....
.....

10. Mention any dangers of applying chemical fertilisers and pesticides to crops?

.....
.....

11. Have you ever been sensitised by any organisation on the benefits of organic agriculture?

1. No [] 2. Yes []

12. If the answer to the above question is yes, mention the institutions involved in the sensitization about the benefits of organic agriculture?

Section D: Participation of small scale farmers in training for organic agriculture

13. Have you participated in any training in organic agriculture?

1. No [] 2. Yes []

14. If so, have you ever practised organic agriculture before?

15. Mention any organisations that have visited your area to sensitize you on the benefits of organic agriculture?

16. Mention any challenges you have faced in accessing information about organic agriculture?

17. Do you think it's important for farmers to take part in training aimed at promoting organic agriculture?

1. No [] 2. Yes []

18. What measures do you think should be put in place for farmers to practice organic agriculture?.....

.....
.....

Thank you for participating in the study.

APPENDIX 3

6. RESEARCH TIME LINE

Core Activities	Details of Activity	Duration	Dates
Proposal Writing	Literature Review Designing of Research Instruments Submission of final draft of research proposal	3 Months	July 2013 To September 2013
Data Collection	Pilot of instruments and actual data collection	3 Months	November 2013 To January 2014
Data Analysis	Preparation, Presentation and Analysis	2 Months	February 2014 To March 2014
Report Preparation	Report writing, typing and editing	3 Months	March 2014 to May 2014
Report Production	Proof reading, printing, binding and submission of final draft	4 Months	July 2014 to October 2014